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TRENDS IN THE SHEEP INDUSTRY OF THE UNITED STATES: Effects of Breed Type and Economic Circumstances

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INTRODUCTION

Historically, a sheep breeding and wool growing industry of size, permanence, and economic importance seems to develop when there is a type or breed of sheep which, because of its inherent characteristics, shows high natural adaptation to the environment. Natural adaptation implies that the type or breed is so adjusted to the conditions of climate, light, topography, soil, feed supply, and husbandry practices that it will remain healthy and manifest fully its inherent productive qualities. Bonsma (6) states the opposite of the above when he points out that lack of this natural adaptation leads either to heavy losses or to increased costs of production in an attempt to modify the environment to suit the animal.

It would seem possible for a type or breed of sheep to lose its fitness because of economic circumstances, even though it may be highly adapted to the environment. Regardless of its intrinsic merit, a type or breed has to be regarded as failing if its natural products can not be produced at a profit.

Thus, it seems that very largely within the framework of natural adaptation or lack of it and an inherent ability to produce acceptable products profitably or lack of it, sheep industries of size, permanence, and economic importance will rise or fall.

Within the realm of individual farm flocks or expansive range bands, many variables play a part in the efficiency and economy of production. Factors of flock management, parasite and disease control, systems of feeding, breeding, housing and herding management, adjustment to and plan for marketing, and practices compatible with climatic conditions all affect success or failure of individual enterprises within particular environments. These are something apart from the basic theses concerning those two factors which affect the rise or fall of the sheep enterprise as an industry.

A study of the history of the sheep industry of the United States indicates that there have been five periods of major decline in sheep population, with losses of 10 million or more sheep in four of the five periods. The relationship or involvement of the two basic criteria mentioned above to these periods of decline and recovery yields some under-

standing of the causes. Perhaps the same causes are involved in the current decline in sheep population which began in 1942 and which, up to 1968, resulted in a loss of nearly 30 million head of stock sheep.

A second point developed by this review is that, historically, the sheep industry has passed through *eras of production,* with each era having its own separate and distinct characteristics based on types, type use, and product demand and use. This publication discusses the historical development of the sheep industry of the United States on the basis of the two basic criteria and the distinctive characteristics of the eras of production.

EARLY SHEEP PRODUCTION IN THE UNITED STATES

Domesticated sheep were unknown to the American aborigines (8). Christopher Columbus on his second voyage in 1493 stopped at Gomera, Canary Islands, and acquired various classes of livestock, including sheep. This laid the foundation for a livestock industry of critical need to those early settlers of the new world.

These first sheep in North America were churros, the common sheep of Spain, a coarse-wooled, long-legged, shallow-bodied type evidencing much variation. From Hispaniola they spread eventually to the mainland and then northward through Mexico into what is now Texas and the Southwest. Wentworth (27) describes many adventures and how these sheep became established as the Navajos and other breeds throughout the Southwest.

Menendez de Aviles took similar sheep when he set out to colonize what is now recognized as the first city in the United States—St. Augustine, Fla. (27). These, too, spread throughout the country and are believed to be the origin of the so-called "Florida natives" and other piney-woods varieties. As a stock they later formed the basis for much crossbreeding with Merinos and other breeds.

THE COLONIAL ERA, 1607-1797

The colonies, beginning with Virginia in 1607, acquired sheep to supply the needs of each family for wool for wearing apparel (8). These sheep are believed to have come from the type or types native to the country from which the people of each colony migrated. Sheep numbers were limited, common grazing grounds were used, and little improvement through breeding seems to have been accomplished. This heterogeneous sheep population formed a basis for later crossbreeding to improved stock.

Only three types seem to have been developed far enough to have a breed identity by 1800—the Ancon or Otter sheep, the Arlington Longwool, and Smith's Island Sheep (13). Only two imported breeds with

names recognized today, the Tunis and the Leicester, seem to have been present prior to 1800.

THE FINEWOOL OR MERINO ERA, 1797-1900

The initial development of fulling mills and looms prior to 1800 and their need for fine wool (9, 11), plus the need of sheep suitable to graze the vast land areas, improve native stock, and yield a product of high economic value, led to importation of Merino sheep to the United States (13, 24). Spain long had held a monopoly on finewool production and on the manufacture of the finest fabrics in the world based on wool from Merino sheep (13, 19). France had been experimenting with Merino sheep for more than half a century for finewool production and native stock improvement (19). The merits of these sheep were recognized by Colonel Humphreys and David Livingston, U. S. government officials in Spain and France, and E. I. DuPont of France.

The migratory Merino from Spain and the French Merino from Rambouillet, France, arrived in the U. S. almost simultaneously (8, 13). However, it was nearly 40 years before the French Merino became significant in the U. S. (2). The Spanish Merino—imported first in 1802 by Humphreys and Livingston and later by Adams, Watson, Wells, Dickinson, and many others—proved well adapted and popular.

During the next decade, Merinos from Spain arrived at U. S. ports of entry by the thousands, although shipments were much reduced in 1812 by Britain through her "search and seizure" policy for contraband goods, largely wool and wool fabrics, on the high seas (8, 13, 24, 27). Success in the War of 1812 guaranteeing freedom of the seas gave the Merino industry new life, but not before the first liquidation of many Merinos had been accomplished. The industry survived, however, and the great era of Merino expansion was underway.

Not less than 101 woolen mills were created between 1801 and 1815 for the manufacture of broadcloth, satinets, cashmeres, flannels, and blankets (9). By 1840, the census enumerated nearly 20 million sheep in 26 states and by 1865 the number exceeded 45 million. Ohio in 1865 had nearly 8 million sheep and it is said that more than 92 percent were Merino or had Merino blood predominating.

Several Merino types were involved. A chronological listing of year of first importation, country of origin, and type is:

1801	Spain	Spanish Merino
1822	Germany	Saxony Merino
1840	Rambouillet, France	French Merino
1851	Germany	Silecian Merino
1897	Germany	Von Homeyer Rambouillet

All were descended from the Merino sheep of Spain. Walker (26) and Powers (15) reviewed and recorded the characteristics and contributions of these types.

The history and characteristics of Merino sheep and production practices in Spain were recorded in many publications (1, 2, 8, 12, 13, 15, 16, 17, 19, 24, 27, 28). Briefly, Spanish Merinos brought to North America were from the migratory flocks which spent the winter season in southern Spain and the summer season in the mountains of northern Spain. These flocks migrated 400 miles in bands of 2,000 to 3,000 each spring and autumn, following trails established for their use. The sheep were small, having been selected and bred solely for superior wool production with everything else sacrificed to that objective. Male lambs, except those reserved for breeding, were usually disposed of at birth so that each ewe lamb could nurse two ewes and thus interfere least with the ewe's wool production. In years of drought and when the trails were devoid of feed, additional lambs were killed so that the ewes had no burden beyond their own maintenance. No harvested feed was ever supplied.

Because of the need to migrate, the instinct to band together in a close-knit unit was highly developed by these sheep, as was their ability to travel long distances, to withstand privation if need arose, and to survive well in spite of drouth. In body form they were angular, usually in thin flesh, and covered with a loose skin. Sheep meat was used only by sheep herders and to them it was not a preferred article of diet. For centuries these sheep were a government monoply guarded against other countries which sought to possess them for their superior wool-growing ability.

The Merino era was a long history of wool merchandising, technological development, and manufacture (9, 25). The development of the factory era began about 1830, followed by the decline in household clothmaking, development of the combing process and worsted manufacture beginning about 1870, and the growth and development of Boston and Philadelphia as wool-merchandising centers (9, 11, 25). The sheep industry not only built a vast empire in the agricultural economy of the country but also was the basis of a great business-industrial complex, all contributing to the comfort and welfare of the human population, and more was to follow.

Historical movements and periods in the sheep industry during the past 100 years appear in Figure 1, a graph of the number of stock sheep as of January 1 each year since 1867 and the average value in dollars per head. The average price of lambs (dollars per cwt.) at Chicago beginning in 1905, the value (cents per pound) of grease wool at the

farm beginning in 1907, and the number of lambs produced annually beginning in 1924 are also given.[1] Figure 1 is divided into three periods: the wool era to 1900, the crossbreeding period to 1950, and the recent period of sheep decline.

An extract from a graph of American Business Activity, prepared by the Cleveland Trust Co., Cleveland, Ohio, is reproduced for the years 1867 to 1967 with their permission as Figure 2. The dotted line is an index of wholesale commodity prices, taking 1926 as 100 percent. Superimposed on this basic graph is a second solid line giving in percentages (using the same base line) increases or decreases of the U. S. sheep population above or below the mean average population of 38,712,000 for the 100-year period.

When the Civil War ended in 1865, the country was faced with a stockpile of wool. Failure of Congress to pass a protective tariff until 1867 allowed wool merchants and manufacturers nearly 2 more years to add to this stockpile. Grease wool dropped from more than $1.00 per lb. to less than 20 cents per lb. and the Merino sheep which produced the wool became almost valueless. This led to the first great liquidation of more than 11 million head of Merino sheep, which set up a cry for development of a sheep which would be to the meat industry what the Merino had been to the wool industry (8). Nothing significant developed in domestic breeding then but the situation is believed to have encouraged importation of English mutton-type sheep during the last third of the 19th century and the beginning of a lamb meat industry in the eastern states.

Fortunately, after the close of the Civil War, the West was ready for expansion. Beginning in 1872, thousands of Merinos began to move to western ranges where sheep in some cases were carried at a cost of 30 cents to $1.00 per head per year and shearers could be hired for as little as 3 cents per head (7, 17). Railroad transportation soon followed and the Merino industry boomed again in number, although not in value per head. An increase of some 18 million head of stock sheep followed in the years from 1872 to 1884, raising the total to 51,101,000 stock sheep.

The Tariff Act of 1884 (18) reduced the protective duty on wool and the Wilson Act of August 1884 removed all protection for the wool-growing industry, causing a decline in sheep which reached 10 million head. This was a period of great discouragement and distress. Free wool wrote finish to the practice of keeping wethers for wool-growing (27). Merino lambs, which averaged barely 40 lb. and furnished an unfattened carcass of 18 to 20 lb. at weaning, had no place either with

[1]From Agricultural Statistics, U. S. Dept. of Agriculture.

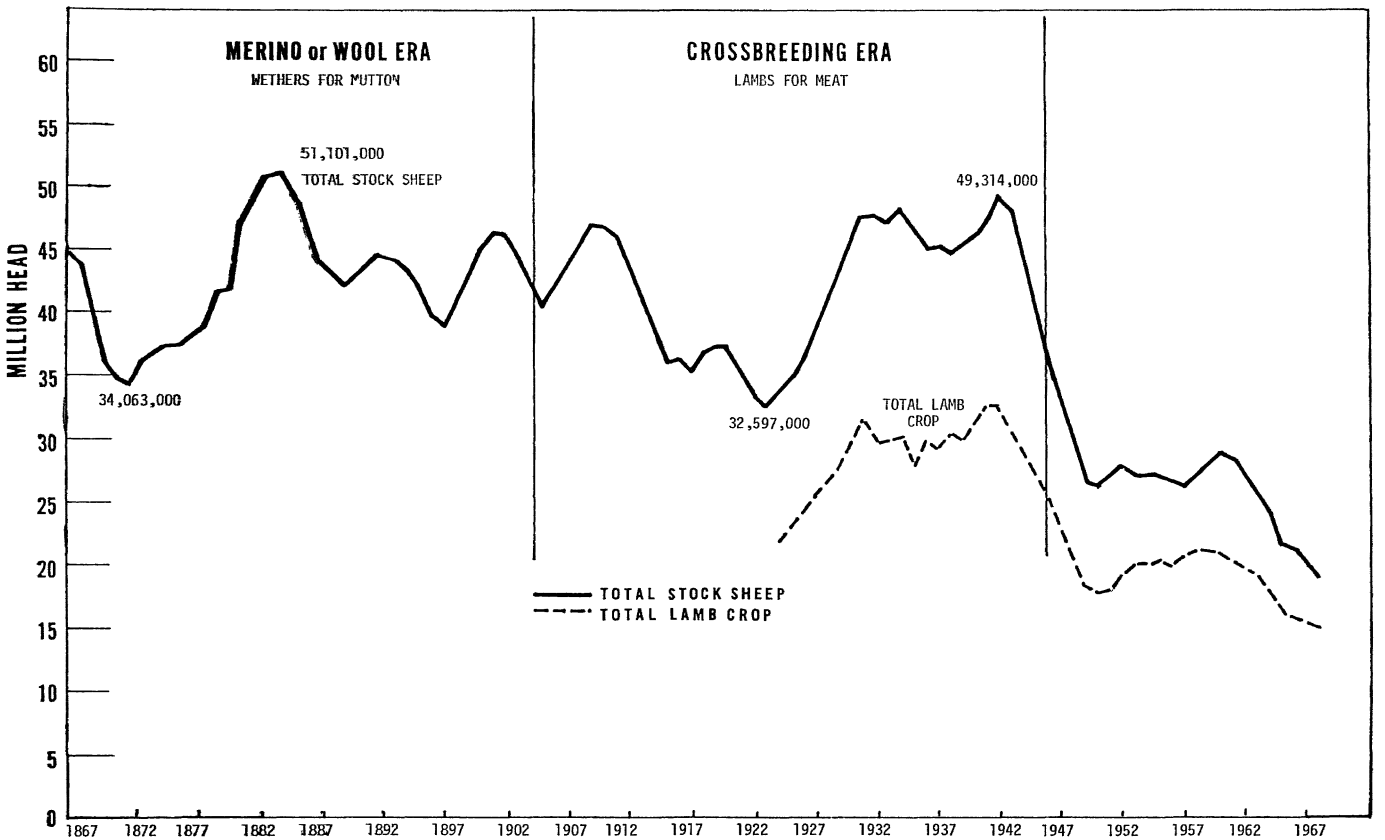
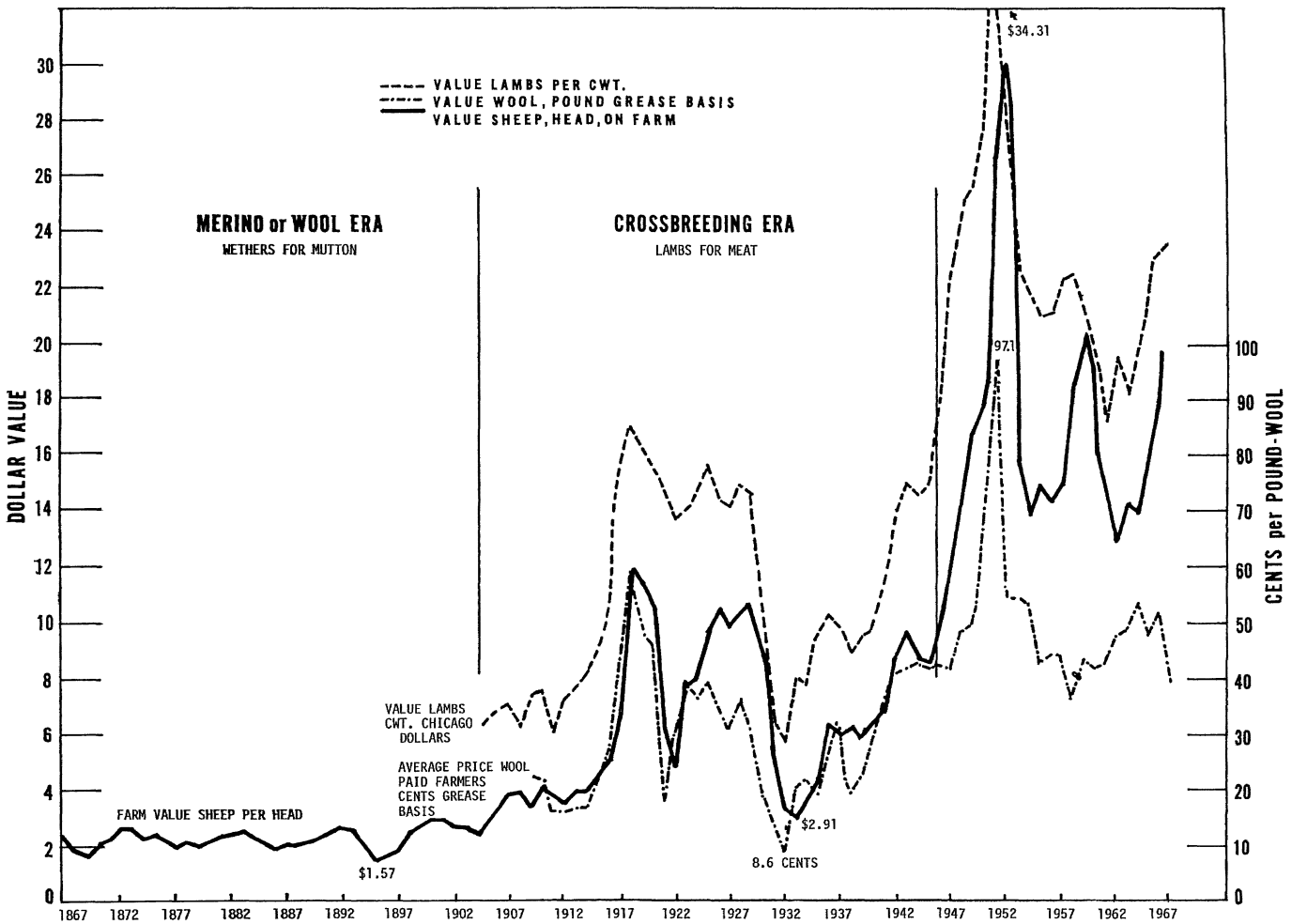


Fig. 1.—Sheep industry statistics, 1867-1967. Total stock sheep and total lamb crop (above) and value of lambs, wool, and sheep per head (below).


VALUE LAMBS PER CWT.
VALUE WOOL, POUND GREASE BASIS
VALUE SHEEP, HEAD, ON FARM
MERINO or WOOL ERA
WETHERS FOR MUTTON
CROSSBREEDING ERA
LAMBS FOR MEAT
$34.31
97.1
VALUE LAMBS CWT. CHICAGO DOLLARS
AVERAGE PRICE WOOL PAID FARMERS CENTS GREASE BASIS
FARM VALUE SHEEP PER HEAD
$1.57
$2.91
8.6 CENTS
DOLLAR VALUE
CENTS per POUND-WOOL
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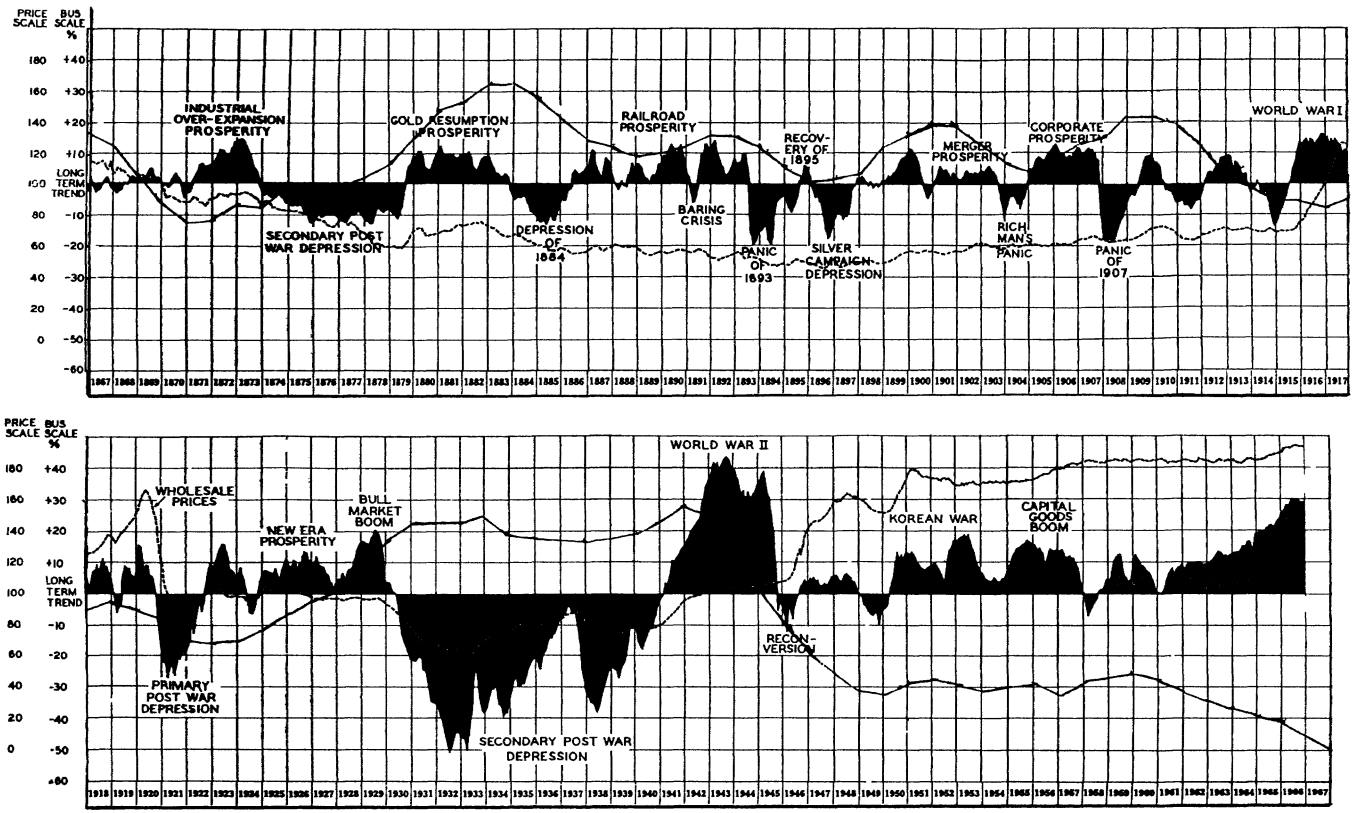

Fig. 2.—American business activity since 1867. Dashed line represents changes in wholesale commodity prices, based on 1926 index = 100. Solid line represents percentage of U. S. stock sheep population above or below the 102-year mean of 38,712,000 head. (Original graph from American Business Activity Since 1790, Cleveland Trust Co., Cleveland, Ohio.)

sheep feeders or in the meat trade. Up to this time, meat from the sheep industry had been marketed largely as 3- and 4-year-old wethers and cast-for-age ewes. Premium prices for lamb as it is known today were virtually non-existent. Powers (15) recorded the market accounts for 2 days in March 1885, showing 5247 head handled in Chicago, of which only 47 were lambs. Wethers sold from $2.30 per cwt. for *poor* to $5.00 for *extra choice*. The lambs, averaging 93 lb., commanded only $5.50 per cwt. The report of the Tariff Commission (20) notes that it was not until 1899 that lambs began to appear on the Chicago market in numbers sufficient to warrant continuous price quotation in the market journals.

The period of transition in range husbandry from the Merino era to the crossbreeding era was 1897-1905. Sheep on the farm first reached an average price of $3.00 per head in 1905 (Fig. 1). For 100 years prior to 1905, the value of a stock sheep had been approximately equal to the value of the fleece it would produce each year.

In 1897, Baron Von Homeyer's meat-type Rambouillet sheep were first exhibited at the World's Columbia Exposition in Chicago (27). They quickly found favor with breeders of the high-withered, sharp-backed, flat-sided, taper-legged, slow-fattening Merino and old style Rambouillets or French Merinos. The extent to which the Von Ho-

Fig. 3.—For more than 100 years, the Merino in flocks of several hundred to several thousand was the basis for the U. S. sheep industry.

meyer meat-type Rambouillet influenced Rambouillet breeders was shown by Dickson and Lush (10). The new type seemed to solve the critical problem of the range sheep grower and Wentworth (27) observed that 98 percent of range sheep soon carried 50 percent or more of Rambouillet breeding. The crossbreeding or lamb-for-meat era largely was launched on this type.

THE CROSSBREEDING ERA, 1900-1942

As this era began, the range sheep industry underwent many changes. Merino flocks were up-graded by top-crossing with the meat-type Rambouillet. Crossbreeding using rams of mutton-type sheep from Britain on Rambouillet ewes was adopted widely. Larger lambs soon were being produced on the range for marketing in September, October, and early November. Feeders, who up to this time had avoided the small slow-gaining Merino lamb and had used their lots for fattening wethers, found the thinner-fleshed meat-type lamb adapted to feedlot feeding in large bands. A secondary industry commonly referred to as commercial lamb feeding, including the grazing of lambs on wheatfields and cornfields of the Middle West, grew to huge proportions.

Fig. 4.—Cornfield fattening of lambs was one system of feeding lambs, along with wheatfield pasturing and drylot feeding.

In some areas of the country it was soon found that these improved Rambouillet sheep and F_1 crossbred females obtained from them were adapted to out-of-season breeding. States such as Kentucky, Tennessee, California, and Arizona, with a climate favorable to fall lambing, undertook programs which became known as "spring lamb production" in which lambs born in October, November, and December were ready for market in April and May. With some lambs suitable for slaughter direct from the range, the feedlots able to supply winter-fed lambs, and spring lambs available to start each new season, the year-round availability of lamb meat became a reality. The transition from wether mutton to lamb meat now seems to have been slow, but by 1918 the annual kill included two or three times as many lambs as wethers (23). The Tariff Commission (22) reported that by 1960 15 times as many lambs were killed as wethers and that, of 90,000 retail outlets for lamb meat, only 7 percent carried mutton. Thus, a new type of sheep, suitable for lamb meat production and for crossbreeding, again revitalized the sheep industry of the U. S.

New problems were soon encountered. For effective range management, the sheep producer depended upon the gregarious instinct of finewool sheep. Crossing with sheep of British origin so reduced this flocking instinct that sheep resulting from two crosses away from finewool type could not be herded readily. Backcrossing the crossbred ewes to the Rambouillet parent breed produced a variety of mongrel types which yielded wool with wide variation, not only between but within individual fleeces.

To eliminate the need to cross and backcross, the U. S. government (at the U. S. Range Experiment Station) and some breeders undertook development of new breeds. Six resulting breeds are known today as the Corriedale, imported from New Zealand, and the Columbia, Targhee, Panama, Romeldale, and the Debouillet, all developed in the United States. All six carry 50 percent or more of Merino or Rambouillet breeding.

The crossbreeding era was characterized by peaks and depressions, both in sheep and lamb population and in product value (Fig. 1). From a business, political, and economic standpoint, the period embraced tariff revision on wool, three depressions, and two world wars in which wool was declared critical war material and was either taken over or controlled by the federal gevernment. Because wool still furnished up to 50 percent of gross income to many sheep growers, wool supplies and prices undoubtedly had considerable effects on trends in the sheep industry.

Beginning in 1912, while the Tariff Commission was involved with

a comprehensive review of the wool industry (21) which resulted in tariff reduction in 1913, the third great liquidation of sheep began. The downward trend lasted almost 12 years and reduced stock sheep by about 12 million head. At the same time, the price of lambs and sheep rose to previously unheard-of heights. In 1918, grease wool averaged 57.9 cents per lb. Stockpile wools held by the allied governments remained both a psychological and a real threat to wool growers. A precipitous decline in grease wool value to an average of 16.4 cents per lb. undoubtedly delayed recovery of the sheep industry and further reduced the number of stock sheep to 32,597,000 in 1923, the lowest number recorded up to that time.

The number of stock sheep began a rise in 1923 which continued for 9 years and remained above 45 million head for an additional 12 years. The lamb crop paralleled the number of stock sheep and in 1932 values fell below $6.00 per cwt. for lambs and to 8.6 cents per lb. of grease wool. This period included the depression years from 1930 to about 1941.

RECENT DECLINE

In 1942, from a peak of 49,314,000 stock sheep and a lamb crop of 32,610,000 head, a fourth precipitous decline began which reached the lowest point yet recorded of 19,184,000 stock sheep and a lamb crop of 15,040,000 as of January 1, 1968. This happened in spite of the highest recorded product values, with lambs being almost continuously $20.00 per cwt. or higher since 1945 and an average of 62 cents per lb. of grease wool assured under subsidy. This period included World War II, the Korean War, and the Vietnam involvement.

SUMMARY AND CONCLUSIONS

It is curious that the four great periods of liquidation in the sheep industry coincided with the four periods of rise in wholesale commodity prices above the mean (Fig. 2). All were war periods: 1812, 1865, 1917, and 1942. Decreases in sheep populations began when wholesale commodity prices first rose above the mean and did not end until the price index dropped below the mean. Conversely, the sheep industry seemed to thrive best, measured by sheep numbers, when the wholesale commodity price index was below the mean or average.

The inverse relationship between the rise and fall in total stock sheep population and the rise and fall in the index of wholesale commodity prices (Fig. 2), as these have occurred over the past 100 years, seems to reveal some points of significance to the student of history of the sheep industry. The 5 years of decline in the Merino industry (involving about 11 million head) following the Civil War, or from 1867 to 1872,

was undoubtedly precipitated by the wartime stockpile of wool as war material plus 2 years of wool imports from 1865 to 1867 free of any tariff protection. Then came the opening of the western country and its offer of cheap maintenance cost to ranchers. Sheep population rose 17 million head in the 10-year period from 1874 to 1884 and to the highest point ever recorded of 51 million stock sheep.

The two tariff acts of 1884 removing all tariff protection on raw wool precipitated the second great decline which began in 1884 and continued for nearly 12 years, with the loss of more than 12 million head. In 1897, the meat-type Rambouillet was introduced and gave new hope to the grower. The sheep industry responded with an 8 million head increase. This was a short-lived response until 1905 brought in the crossbreeding era and lambs for meat on a year-round basis became a reality.

With the beginning of World War I, the sheep population began a third downward trend. The industry lost more than 14 million head between 1910 and 1928, when an upturn was recorded. The downward trend was not halted during the war period despite the new high prices for lambs and wool. The index of wholesale commodity prices, however, was the highest yet recorded. The basis of operation for sheep raising also was undergoing vast changes. The total capital required in the Northwest to run a band of 3000 head, which had been less than $8,000 prior to 1910, jumped during World War I to more than $20,000 (20). Labor, which earlier had been plentiful and obtainable at $30 to $40 per month, soon was costing $90 to $100 per month, with foremen paid from $125 to $200 per month. This did not include the cost of extra help at lambing, shearing, and dipping time. The cost of inputs rose to equal and sometimes to exceed the value of outputs from the industry. By 1920, the crisis was past in the so-called cost-price squeeze (see Fig. 2) and the sheep industry started its upturn in 1923. By 1931, the industry had increased more than 15 million head. With the index of wholesale commodity prices low and lambs for meat featuring production, the sheep industry was a sound business for nearly two decades.

Beginning early in World War II, the index of wholesale commodity prices started to rise and as this happened the sheep population started to decline. The lag between the rise in the index of wholesale commodity prices and the start of the great sheep decline was less than 1 year (Fig. 2). This boom in the price of capital goods has continued unabated and the sheep decline amounting to more than 30 million also has continued largely unabated. Apparently the sheep industry has encountered a cost-price squeeze of previously unheard-of duration.

The only way to combat the constantly increasing cost of inputs in the sheep industry is with higher prices for and greater quantities of outputs from the industry. The value of outputs, especially lambs, has increased. The industry, however, has remained static with respect to quantities of outputs. The average yearly lamb crop (total lambs raised as a percentage of ewes 1 year old or older) continues to range from 87 to 97 percent, with the recently higher percentage probably due to changes in type use away from the less prolific finewool types. Wool production is static and ranges between 8.5 and 9 lb. of grease wool per sheep per year.

The number of lambs available for market each year likewise remained constant from 1924 to 1950 and has risen only moderately since 1950. If it is assumed that 20 percent of the lamb crop is required for replacement of breeding stock and implying complete replacement each 5 years, there would remain 53 lambs for market per 100 head of stock sheep in 1924, 49.5 lambs in 1929, 50.5 lambs in 1934, 52.6 lambs in 1939, 51.5 in 1944, 53 lambs in 1949, 60 lambs in 1954, 60 lambs in 1959, 58 lambs in 1964, and 69 lambs (on the basis of preliminary figures) in 1969. Apparently there has been some adjustment upward in the last few years, with this adjustment due either to liquidation of the less prolific types or more attention given to methods of management which will stimulate ewes to higher productivity.

A study of types of sheep and systems of breeding in Ohio from 1940 to 1948 explored the problem of Merino sheep decline in the hilly, grassland areas adjacent to the Appalachian Mountains (4). This project, sponsored initially by the sheep research, teaching, and extension specialists of New York, Pennsylvania and West Virginia, sought reasons for the rapid decline of Merino sheep in an area where this type had reigned supreme for nearly 150 years. The project included the concept that either an orderly system of crossbreeding or of top-crossing a Merino female base to meat-type rams might strengthen the Merino industry by increasing crossbred lamb sales, by using F_1 females as breeding ewes, or by upgrading the flock with Corriedale and Columbia rams.

Merino records showed a lamb rearing rate averaging only 85 percent under good to excellent husbandry and feeding and a much lower rate if husbandry and feeding was poor (3). Nursing lambs and lambs on full feed in the fattening lot averaged 0.28 lb. weight gain per day and less during summer grazing after weaning. Thus, Merino lambs required nearly 1 year to reach 95 lb. Further, the tendency of Merinos to use nutrients preferentially for wool growth caused fattening lambs to require from 11 to 22 percent more feed per 100 lb. of weight gain than meat-type lambs. Finally, dressing percentage averaged only 46

percent, carcass grade rarely exceeded high good, and carcass edible portion averaged 3 to 4 percent less than meat-type carcasses of the same weight. Thus, the Merino failed to meet existing economic conditions.

Breeding Merino ewes to rams of two sub-Merino breeds or to British meat-type rams was not successful economically in these tests. Initial crossing did not appreciably increase the number of progeny born or raised, perhaps because there was no change in the maternal traits of the female. The use of meat-type sires resulted in some increase in growth rate, lamb quality, and carcass yield. However, the additional income could not overcome the cost of maintaining the non-rearing ewes which were crossbred and the half of the flock bred pure Merino to furnish ewes for subsequent crossbreeding. Crossbreeding as a system of breeding seemed to likely to fail if the breed used as the basis for crossbreeding could not be raised with profit when bred pure.

Low fertility and low rearing rate may be the principal reasons for the breakdown of the crossbreeding era and the recent decline in sheep population. Since the national average rearing rate was only 93 per-

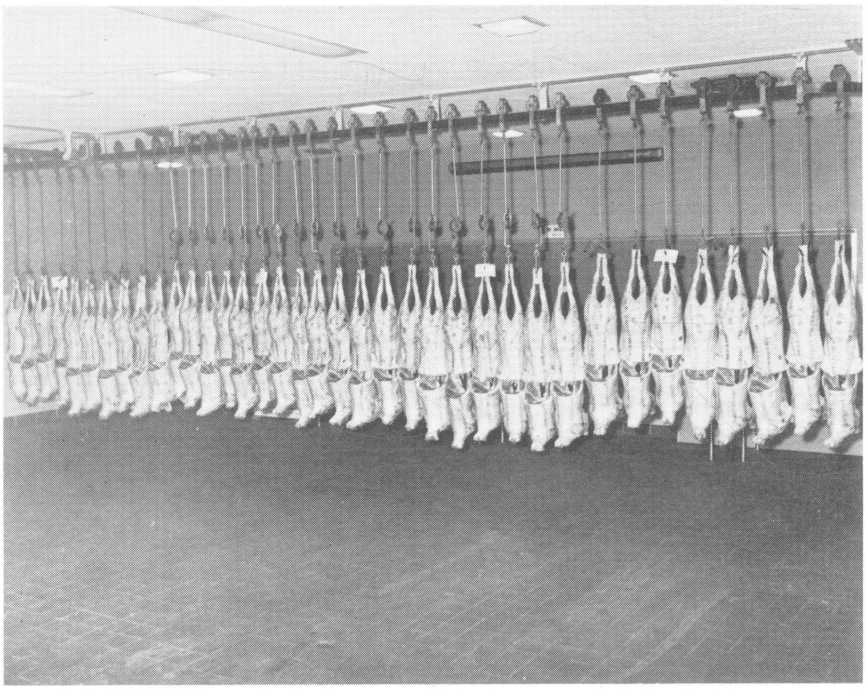

Fig. 5.—Increasing the number and improving the quality of lamb carcasses per 100 head of stock sheep offers the greatest hope for reviving the U. S. sheep industry.

cent in 1967, many flocks must reproduce so poorly as to be uneconomic.

Sheep producers in the region under study began to liquidate their Merino flocks during the early 1940's. This trend continued until today only a vestige remains of what was once the principal type in a vast sheep-raising industry.

With a declining sheep population and the need for a higher output of lambs, two broad avenues of approach to the problem are open. Either the sheep on hand must be induced to yield more lambs or they must be replaced by more productive sheep. In the former case, the problem belongs to the reproductive physiologist and the husbandman; in the latter case, it belongs to the population geneticist and the animal breeding specialist.

To seek long-term gains on a permanent basis, a North Central regional sheep breeding project was proposed in 1958 with the objective of improvement in lamb meat production. It seemed appropriate that this research should be located in the North Central Region because it holds about 29 percent of the nation's breeding ewes and produces about 32 percent of the lamb crop.

A progress report for the period 1958-1967 has been published as North Central Regional Research Publication No. 198, Improvement of Lamb Meat Production Through Breeding. Copies are available from all State Agricultural Experiment Stations in the North Central Region.

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The State Is the Campus for Agricultural Research and Development

Ohio's major soil types and climatic conditions are represented at the Research Center's 11 locations. Thus, Center scientists can make field tests under conditions similar to those encountered by Ohio farmers.

Research is conducted by 13 departments on more than 6200 acres at Center headquarters in Wooster, nine branches, and The Ohio State University.

Center Headquarters, Wooster, Wayne County: 1953 acres
Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres
Jackson Branch, Jackson, Jackson County: 344 acres
Mahoning County Farm, Canfield: 275 acres
Muck Crops Branch, Willard, Huron County: 15 acres
North Central Branch, Vickery, Erie County: 335 acres
Northwestern Branch, Hoytville, Wood County: 247 acres
Southeastern Branch, Carpenter, Meigs County: 330 acres
Southern Branch, Ripley, Brown County: 275 acres
Western Branch, South Charleston, Clark County: 428 acres